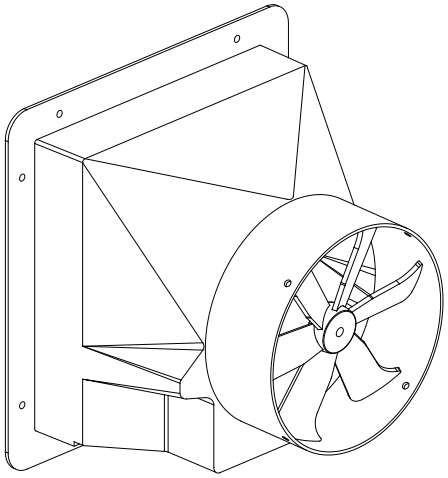
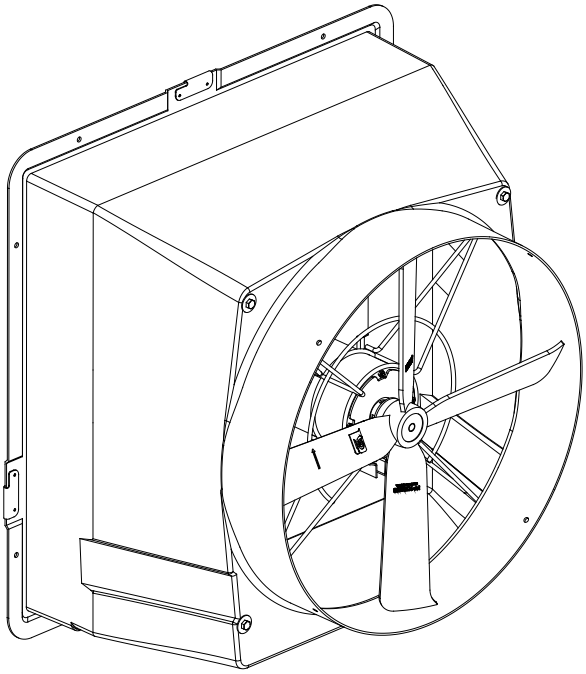
VORTEX® FANS
9" - 26" Direct Drive

VX09P • VX14F • VX16F • VX18F • VX24F • VX26F

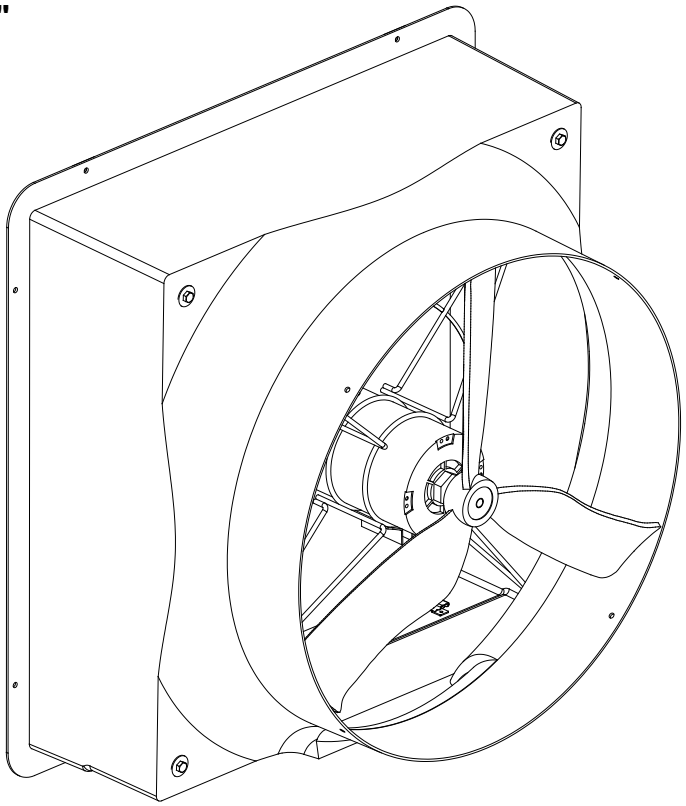
aerotech® Ventilation Systems



9"



14" - 24"



26"

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USER'S MANUAL and INSTALLATION GUIDE

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THANK YOU

Thank you for purchasing a Vortex Direct Drive Fan from Munters. Munters equipment is designed to be the highest performing, highest quality equipment you can buy. With the proper installation and maintenance it will provide many years of service.

PLEASE NOTE

To achieve maximum performance and insure long life from your Munters fan it is essential that it be ***installed and maintained properly.*** Please read all instructions carefully before beginning installation.

WARRANTY

For Warranty claims information see the "Warranty Claims and Return Policy" form QM1021 available from the Aerotech Ventilation System, Munters Corporation office at 1-800-227-2376 or by e-mail at aerotech@munters.com.

Conditions and Limitations:

- Products and Systems involved in a warranty claim under the "Warranty Claims and Return Policy" shall have been properly installed, maintained and operated under competent supervision, according to the instructions provided by Aerotech Ventilation Systems, Munters Corporation.
- Malfunction or failure resulting from misuse, abuse, negligence, alteration, accident or lack of proper installation or maintenance shall not be considered a defect under the Warranty.

UNPACKING THE EQUIPMENT

Before beginning installation, check the overall condition of the equipment. Remove packing materials, and examine all components for signs of shipping damage. Any shipping damage is the customer's responsibility and should be reported immediately to the freight carrier.

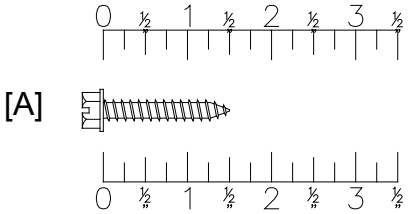
Each Fan Includes:

1 - Direct Drive Fan

1 - Hardware Package (HP1145)

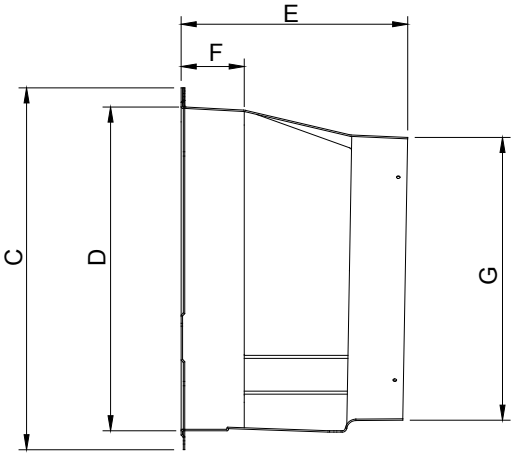
HP1145 for Vortex Direct Drive fan

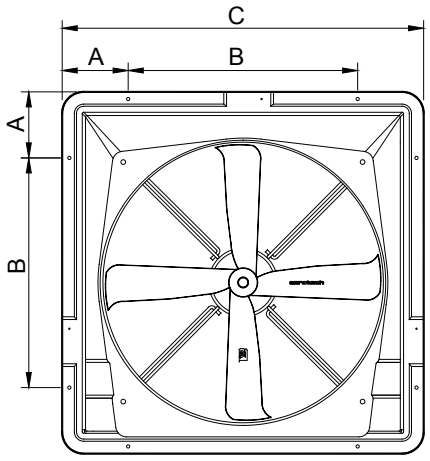
[A].....8 - #14 x 1.5" Lag Screws, S.S.



Fan Specifications:
Power: 120 or 240 VAC
Phase: 1
Hertz: 60

FAN DIMENSIONS





CAT. NO.	FAN DIA.	NO. OF BLADES	A	B	C	D	E	F	G	Wall Opening (I.D., framed)
VX09P	9"	6	2 3/4"	9 1/2"	15"	12"	11 1/2"	2 1/2"	9 1/2"OD	12 1/2" sq.
VX14F	14"	7	4 5/16"	12"	20 5/8"	17 3/8"	16 5/8"	7"	14 5/8"OD	17 1/2" sq.
VX16F	16"	4	4 3/4"	16"	25 1/2"	22 1/4"	18 3/4"	5 1/2"	16 11/16"OD	22 1/2" sq.
VX18F	18"	5	4 3/4"	16"	25 1/2"	22 1/4"	18 3/4"	5 1/2"	18 11/16"OD	22 1/2" sq.
VX24F	24"	4	5 3/4"	20"	31 1/2"	28 1/4"	19 3/4"	5 1/2"	24 11/16"OD	28 1/2" sq.
VX26F	26"	3	5 1/2"	22"	33"	29 3/4"	18 1/8"	10 7/16"	27"OD	30 1/4" sq.

INSTALLATION INSTRUCTIONS

Step 1

Construct the framed opening to correct size according to the above chart and your fan size. ***See Figure 1.***

If a 9" Vortex fan was purchased, proceed to Step 7.

If a PV or PZ shutter was purchased proceed to step 2, if a PT shutter was purchased proceed to step 5.

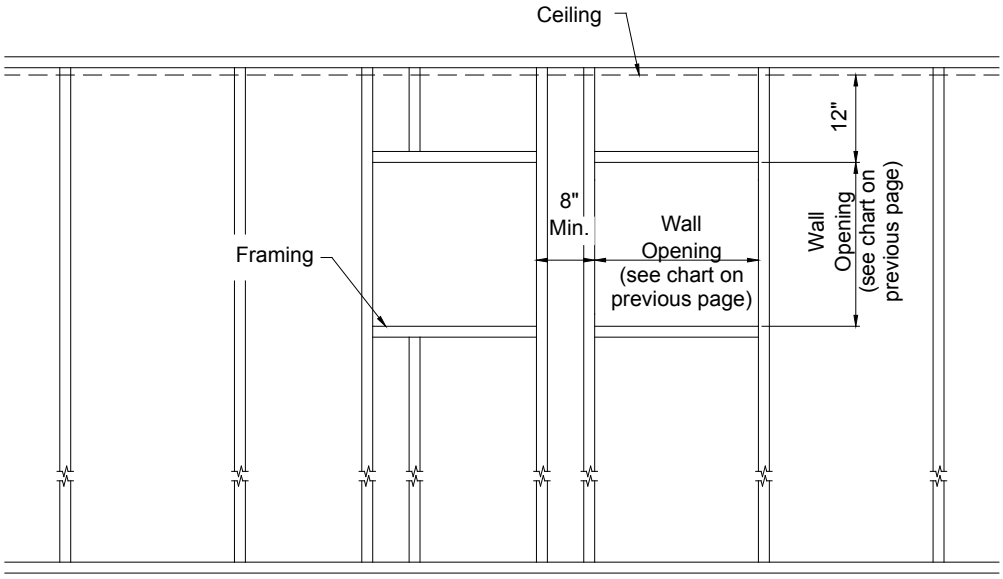
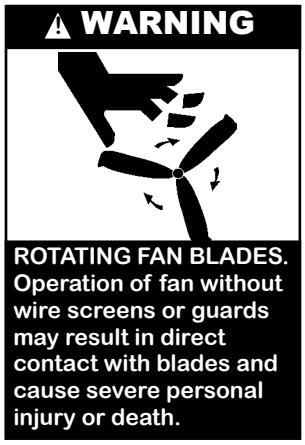


Figure 1

FAN WITH 'PV' OR 'PZ' STYLE SHUTTER


WARNING
ROTATING FAN BLADES. Operation of fan without wire screens or guards may result in direct contact with blades and cause severe personal injury or death.

Step 2

Insert fan into the framed opening from the inside and fasten with (8) Lag Screws [A] (provided). Flash and caulk around opening. ***See Figure 2.***

Step 3

Outlet of fan comes unguarded, it is recommended that an Aerotech discharge cone with guard, a fan hood with guard or a guard by others is installed on outlet of fan at this time.

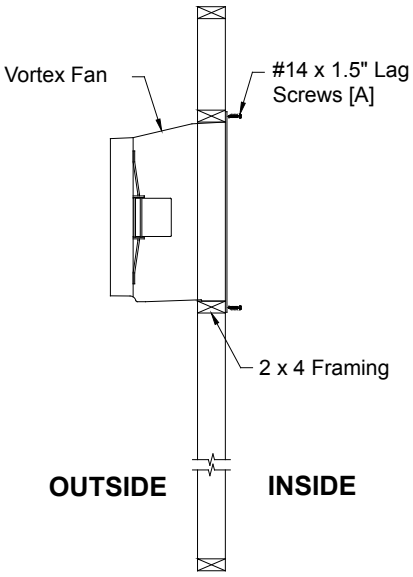


Figure 2

Step 4

Slide shutter into back of fan. ***See Figure 3A.*** Fasten shutter in place by rotating the side and top shutter clips over the shutter flanges. ***See Figure 3B.***

Installation is now complete, proceed to Electrical Wiring Section.

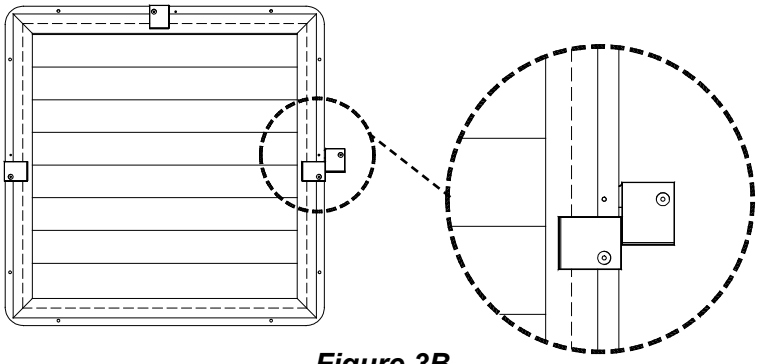


Figure 3B

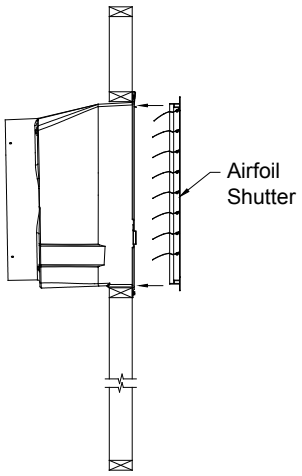


Figure 3A

FAN WITH 'PT' STYLE SHUTTER

Step 5

Insert fan into the framed opening from the inside and fasten with (8) Lag Screws [A] (provided). Flash and caulk around opening. ***See Figure 4.*** If fan and shutter needs to be mounted flush to inside wall, ***See Figure 5*** for framing details.

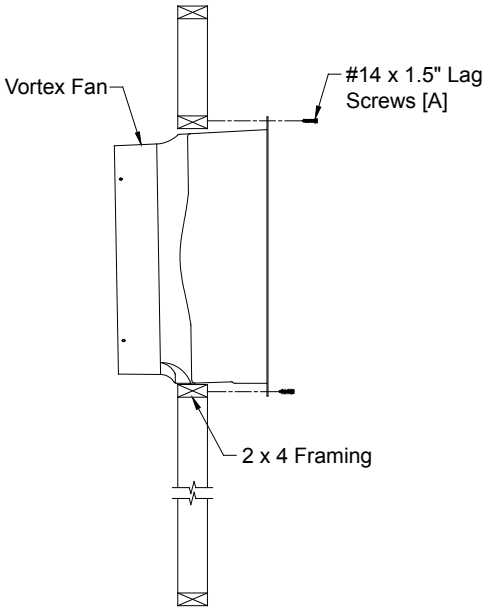
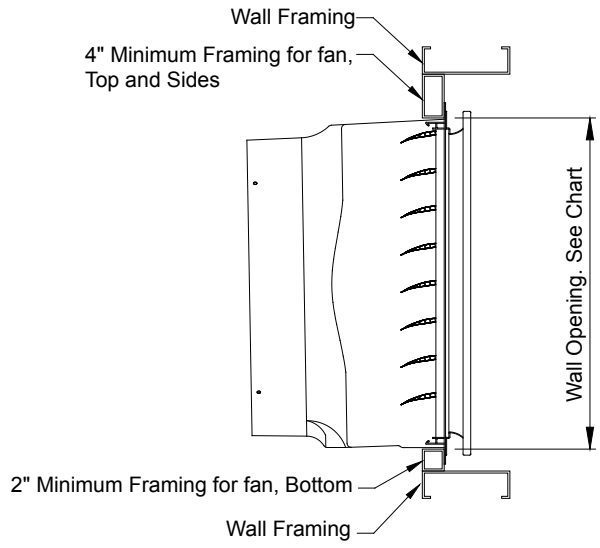


Figure 4



Fan Framed Opening Chart	
14"	17½" sq.
16"	22½" sq.
18"	22½" sq.
24"	28½" sq.
26"	30¼" sq.

Figure 5

FAN WITH 'PT' STYLE SHUTTER

Step 6

Insert PT shutter into fan. ***See Figure 6A.*** Fasten shutter in place by rotating the side and top shutter clips over the shutter flanges. ***See figure 6B.***

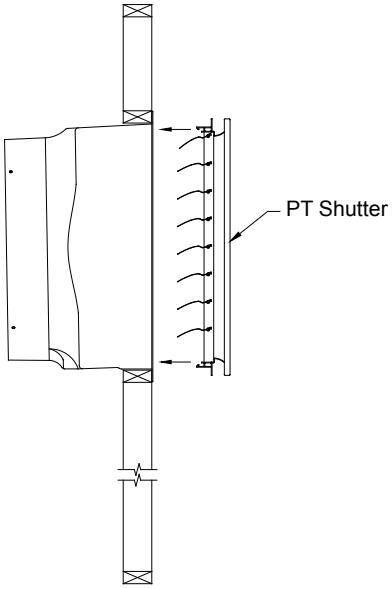


Figure 6A

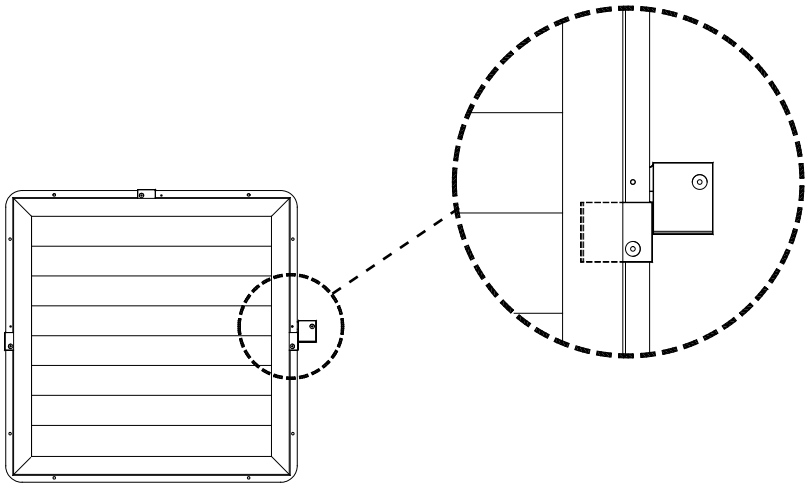


Figure 6B

NOTE: Shutter protrudes from fan 2 15/16". Provide adequate guarding to protect shutter.
Installation is now complete, proceed to Electrical Wiring Section.

9" Vortex Fan Instructions:

Step 7

Mount the fan to the framed opening from the outside of the building and fasten with (8) Fastner [A]. Be sure fan is mounted upright. Flash and caulk around opening. ***See Figure 7.***

Step 8

If fan was purchased with shutter, mount shutter to inside of building. Fasten shutter in place with (6) Tapping screws (not provided).

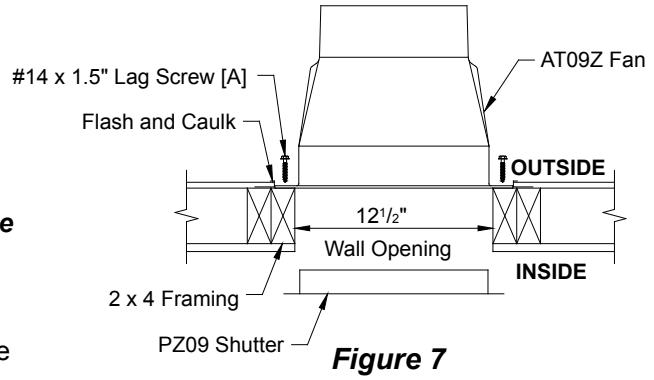


Figure 7

Step 9

If fan needs to be mounted from the inside, install the fan through the wall and fasten using (8) Fastener [A] (provided). Then install 1 1/2" spacer strips around the opening in the back of the fan before fastening shutter in place. ***See Figure 8.***

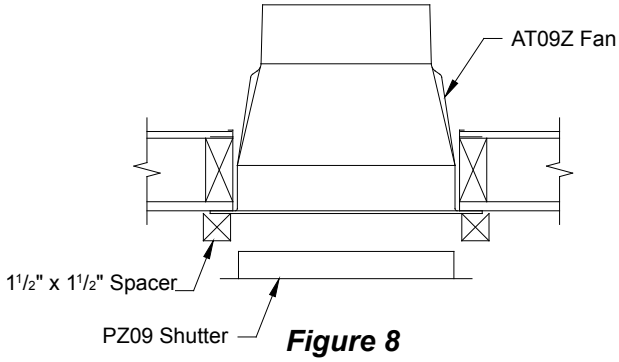


Figure 8

Recommended Wire Routing:
As the power cable exits the back of motor form a drip loop and then run power cable down along motor mount and "Zip" tie the cable to motor mount to prevent cable from getting tangled in the prop. **See Figure 9.** Then run the cable out the drain hole to the circuit breaker or control panel.

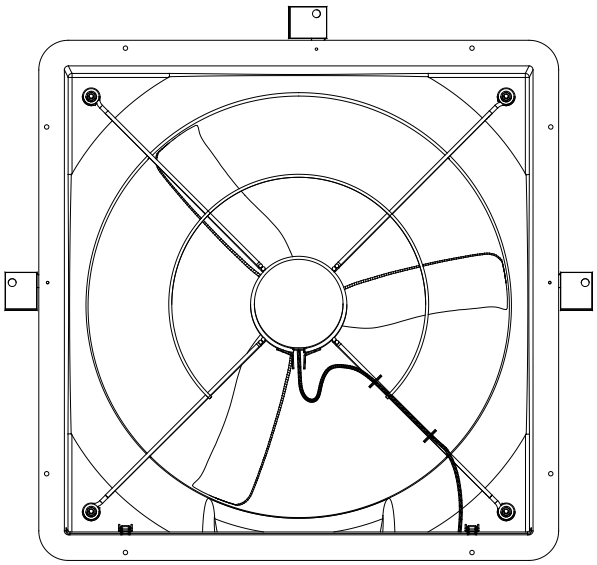
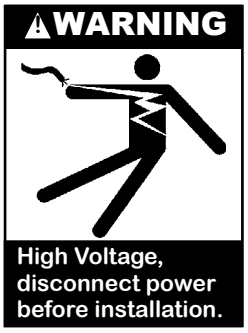


Figure 9



All wiring should be installed in accordance with National, State, and Local electrical codes. Fans used to ventilate livestock buildings or other rooms where continuous air movement is essential should be connected to individual electrical circuits, with a minimum of two circuits per room. For electrical connection requirements, refer to diagram on motor nameplate and to information enclosed with the Aerotech environmental control to be used.

Motor overload protection should be provided for each fan. A Circuit Breaker Switch or slow blow motor type fuses must be used ***See Figure 10.*** See Aerotech form **QM1400** for proper size. *NOTE: A safety cut-off switch should be located adjacent to each fan.*

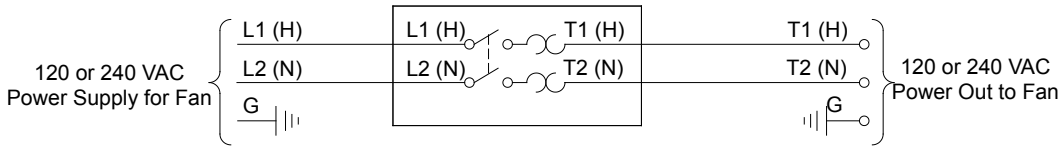


Figure 10
Motor Overload Protection with Disconnect (SY2000 or Equivalent)

KEY:
L1 = Line 1 H = Hot
L2 = Line 2 N = Neutral
G = Ground

NOTE: Information in parenthesis refers to 120 VAC control.

OPERATION

1) **INITIAL START-UP:** With electrical power off, verify that the fan propeller turns freely and that all fasteners are secure. Turn on electrical power and confirm that the fan operates smoothly.

2) **ADJUSTMENTS:** Set the fan control to the temperature shown on your Aerotech ventilations system drawing, or to a value which will provide the desired environmental conditions.

When variable speed controls are used, the fan's idle speed will need to be set to the recommended minimum airflow rate. Refer to the procedures included with each control. The following table provides airflow rates at various propeller speeds for fans wired for 240 VAC:

A = Fan with cone & shutter B = Fan with hood & shutter C = Fan with hood & no shutter

	CFM	0.025" Static Pressure						0.05" Static Pressure					
		A		B		C		A		B		C	
		RPM	VOLTS	RPM	VOLTS	RPM	VOLTS	RPM	VOLTS	RPM	VOLTS	RPM	VOLTS
9" Fans	50	970	74	1050	75	—	—	1000	80	1100	81	950	71
	100	1120	77	1200	79	720	61	1180	85	1250	86	1090	77
	150	1290	83	1350	84	800	63	1380	90	1450	91	1200	81
	200	1490	88	1550	90	880	66	1590	96	1660	99	1270	86
	250	1690	93	1750	95	970	70	1710	102	1820	103	1350	90
	300	1870	98	1950	100	1070	79	1810	105	1920	107	1420	95
	400	1930	107	2080	110	1290	91	2000	112	2110	115	1560	103
	500	1990	115	2140	119	1530	104	2160	119	2300	124	1700	112
	600	2150	124	2250	129	1770	116	2270	129	2440	134	1860	121
	700	2330	134	2430	140	2030	130	2480	138	2580	146	2120	135
	800	2570	146	2630	157	2310	144	2690	152	2770	163	2380	149
	900	2820	162	2870	177	2580	158	2920	169	3020	187	2640	165
	1000	3120	183	3120	219	2830	189	3180	193	3230	229	2910	197
	1100	—	—	—	—	3130	221	—	—	—	—	3180	228

		A		B		A		B	
14" Fans	100	620	141	620	141	740	150	740	150
	120	630	142	630	142	750	151	750	151
	150	640	142	640	142	760	152	760	152
	200	660	143	670	144	780	153	790	153
	300	710	145	720	146	820	154	820	154
	400	760	148	780	149	860	156	870	156
	500	810	151	840	153	910	158	930	160
	600	840	153	880	155	950	161	980	162
	800	940	158	980	160	1030	164	1070	166
	1000	1030	163	1070	165	1120	168	1180	170
	1200	1130	168	1210	173	1210	173	1280	177
	1600	1370	182	1480	197	1400	186	1500	205
	1950	1640	218	—	—	1630	230	—	—

A = Fan with cone & shutter B = Fan with hood & shutter

	CFM	0.025" Static Pressure				0.05" Static Pressure			
		A		B		A		B	
		RPM	VOLTS	RPM	VOLTS	RPM	VOLTS	RPM	VOLTS
16" Fans	150	590	96	600	96	700	103	720	104
	175	600	96	610	97	710	103	730	104
	200	610	97	620	98	720	104	740	105
	300	640	98	660	99	740	105	760	106
	400	670	100	700	102	770	106	780	107
	500	700	102	740	104	800	108	810	108
	600	730	103	780	106	830	109	840	110
	800	790	107	860	111	880	112	920	114
	1000	850	110	940	115	940	115	1000	117
	1250	930	114	1020	119	1020	118	1100	124
	1500	1020	119	1110	124	1090	123	1200	128
	1750	1100	123	1220	129	1180	127	1350	136
	2000	1190	127	1330	134	1260	131	1460	142
	2500	1380	136	1600	160	1430	140	1630	172
	3000	1600	160	—	—	1640	173	—	—
	3170	1680	190	—	—	1720	230	—	—
18" Fans	300	520	128	530	128	660	134	670	135
	400	550	129	560	129	670	135	680	136
	500	570	130	590	132	680	136	700	137
	600	590	132	610	133	710	137	740	139
	700	620	133	640	134	730	138	770	140
	800	640	134	660	135	740	139	780	141
	1000	700	136	730	138	780	141	830	143
	1250	760	139	800	141	840	144	890	147
	1500	820	143	860	144	890	147	950	150
	1750	880	145	950	149	940	149	1000	153
	2000	940	148	1020	152	990	152	1060	155
	2500	1070	154	1170	161	1110	157	1220	164
	3000	1210	162	1360	171	1240	165	1380	172
	3500	1380	172	1530	188	1420	175	1570	190
	4000	1570	190	—	—	1610	200	—	—
	4200	1650	207	—	—	1680	230	—	—
24" Fans	1000	—	—	—	—	490	144	510	145
	1250	—	—	—	—	520	146	530	147
	1500	480	141	490	142	540	148	560	150
	1750	500	143	520	144	560	150	600	153
	2000	530	145	550	147	580	152	630	157
	2250	560	148	590	151	610	154	670	160
	2500	580	150	620	153	630	157	690	163
	2750	610	152	660	156	660	159	720	166
	3000	640	155	690	160	680	162	740	168
	3500	690	160	760	167	730	167	790	172
	4000	750	166	820	172	790	172	860	179
	4500	820	172	900	183	850	178	940	191
	5000	890	181	990	202	920	187	1020	210
	5500	970	195	1060	230	1000	204	—	—
	6000	1060	227	—	—	—	—	—	—

A = Fan with cone & shutter B = Fan with hood & shutter

	CFM	0.025" Static Pressure				0.05" Static Pressure			
		A		B		A		B	
		RPM	VOLTS	RPM	VOLTS	RPM	VOLTS	RPM	VOLTS
26" Fans	1250	—	—	—	—	510	147	520	148
	1500	—	—	480	142	530	149	550	152
	1750	480	142	500	144	540	151	580	154
	2000	500	144	520	146	560	153	610	158
	2250	520	146	550	149	580	154	640	161
	2500	540	148	580	152	590	156	650	162
	2750	560	150	610	155	610	158	670	164
	3000	580	152	630	157	630	160	690	166
	3500	620	156	680	163	670	164	730	171
	4000	660	161	730	169	710	168	780	177
	4500	700	165	780	176	740	172	830	182
	5000	740	170	840	183	780	177	880	189
	5500	780	176	880	188	830	182	930	199
	6000	830	181	930	194	870	188	970	205
	6500	880	188	980	206	920	194	1030	225
	7000	940	196	1040	225	970	205	—	—
	7500	990	208	—	—	1020	222	—	—
	8000	1050	229	—	—	—	—	—	—

MAINTENANCE

⚠WARNING

High Voltage, disconnect power before servicing.

⚠WARNING

Moving parts, disconnect power before servicing.

⚠WARNING

Do not power wash.

The following inspection and cleaning procedures should be performed monthly:

1) INSPECT PROPELLER: Check that propeller is secure on motor shaft and that there are no signs of damage. The blades are of a self-cleaning design and should not require maintenance.

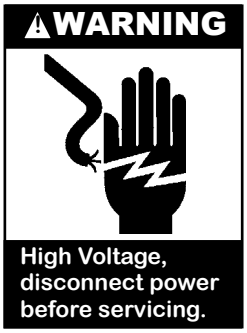
2) CLEAN regularly for best results:

- FAN MOTOR: Remove any dust accumulation from motor using a brush or cloth. (DO NOT use a pressure washer). A clean motor will run cooler and last longer. At the same time, verify that the motor is secure in its mount.
- SHUTTER: Carefully clean dust from shutter blades and frame so that shutter opens and closes freely. A brush or cloth should be used.
- GUARD: Clean any dust or feathers from fan guards using a brush. Dirty guards can reduce airflow.
- PIPE HOUSING: Remove dust accumulations from bottom of pipe housing. Exterior of pipe housing may be cleaned with mild soap and water; abrasives are not recommended.

3) CHECK FASTENERS: For safety, all fasteners should be inspected. Tighten any loose connections.

4) INSPECT FAN CONTROL: With power disconnected, inspect all electrical connections. Wiring should be secure and in good condition. Remove any dust build-up from control case and sensor using a soft brush or cloth. **NEVER CLEAN ELECTRICAL EQUIPMENT WITH A PRESSURE WASHER!**

TROUBLE SHOOTING



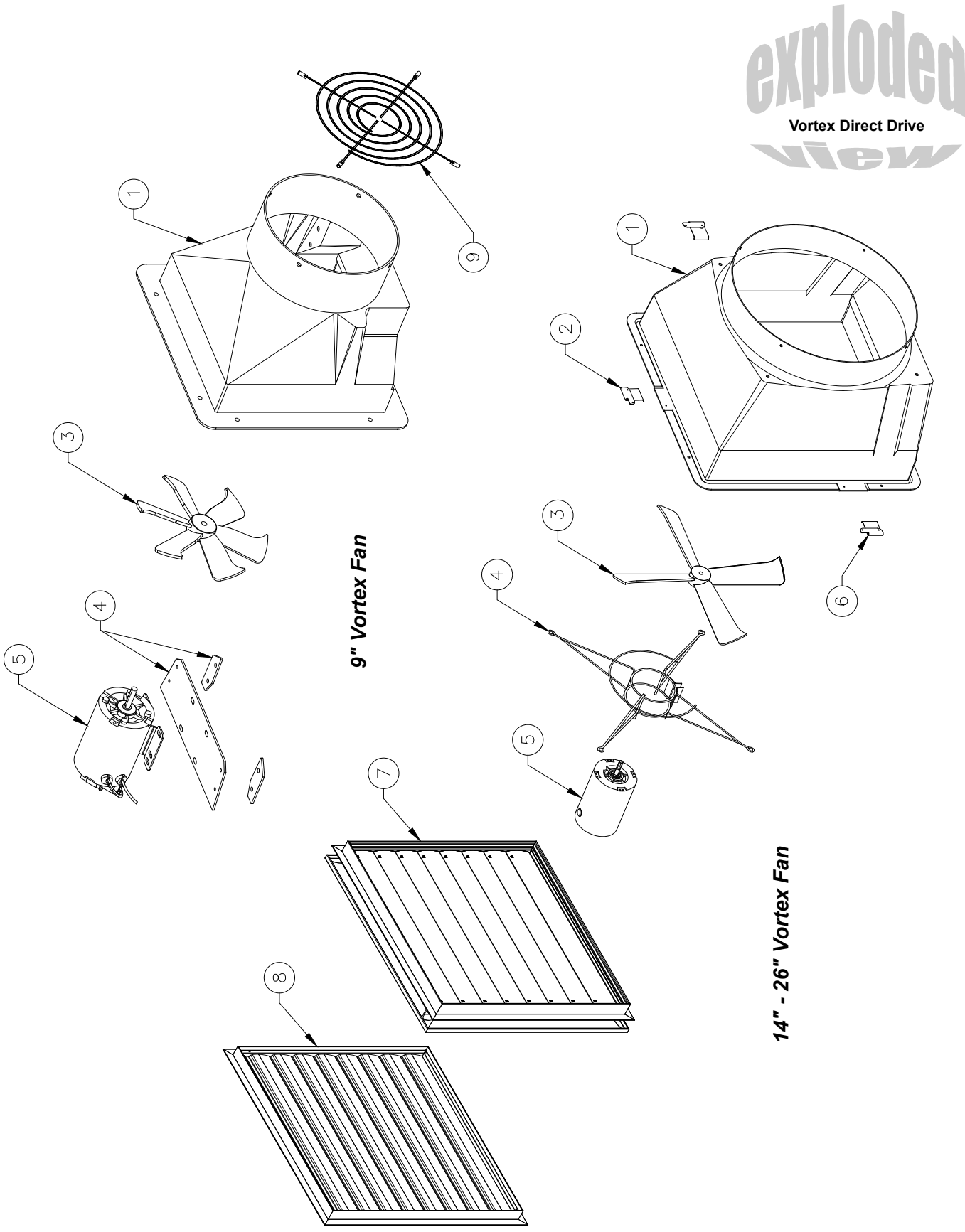
SYMPTOM	POSSIBLE CAUSES	CORRECTIVE ACTION
Fan Not Operating	1. Fan control set above room	Set to a lower temperature
	2. Blown fuse or open circuit breaker	Replace fuse or reset breaker
	3. Propeller blade contacting fan housing	Realign motor in fan housing
	4. Fan control defective	Repair or replace control
	5. Motor defective	Repair or replace motor
Fan Operating-Insufficient Airflow	1. Variable speed control improperly adjusted	See Operation, Step 2 for adjustment guidelines
	2. Shutter jammed	Clean shutter & fan housing
	3. Guard dirty	Clean guard
Excessive Fan Noise	1. Variable speed control idle speed set to low	Increase idle speed setting
	2. Variable speed control defective	Repair or replace control
	3. Propeller blade contacting fan panel	Realign motor in fan housing
	4. Motor bearing defective	Repair or replace motor
Excessive Fan Vibration	1. Motor loose in mount	Tighten fasteners
	2. Propeller damaged	Replace propeller
	3. Motor shaft bent	Repair or replace motor
Fan never turns off	1.Override thermostat set incorrectly	Set to the correct temperature
	2. Control set for continuous operation	Set speed control correctly

WINTERIZING FAN

In most climates, it is probable that the ventilation system will never need to operate at a total capacity during the colder winter months. Consequently, it is advisable to "winterize" those fans which will not be used in cold weather to avoid unnecessary heat loss and condensation.

To winterize, turn fan control "off". Install the insulated closure panel over the fan intake. If you don't have an insulated closure panel, a piece of rigid insulation material can be used. **Remember the insulation panel must be removed before warmer weather returns.**

NOTE: At least one single speed fan should be left uncovered and with power available to provide air movement in the event of variable speed control difficulties.


exploded
Vortex Direct Drive
view
1
9
3
4
5
9" Vortex Fan
1
2
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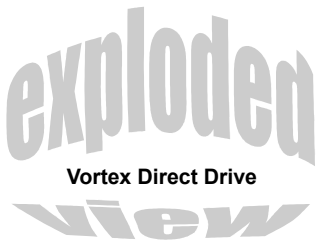
7
8
14" - 26" Vortex Fan



Item	Catalog No.	Description	Qty.
1	FH2109	Housing, 9" Vortex Fan, with Labels, PL	1
	FH3414	Housing, 14" Vortex Fan, with Clips & Labels, FG	1
	FH3416	Housing, 16" Vortex Fan, with Clips & Labels, FG	1
	FH3418	Housing, 18" Vortex Fan, with Clips & Labels, FG	1
	FH3424	Housing, 24" Vortex Fan, with Clips & Labels, FG	1
	FH3127	Housing, 26" Vortex Fan, with Clips & Labels, FG	1
2	FH2119	Right Shutter Clip, AL	2
3	FP1036SS	Propeller, 9"DD, 6-Blade, Set Screws, AL	1
	FP1031SS	Propeller, 14"DD, 7-Blade, ½" Bore, Set Screws, AL	1
	FP1038SS	Propeller, 16"DD, 4-Blade, Set Screws, AL	1
	FP1008SS	Propeller, 18"DD, 5-Blade, ½" Bore, Set Screws, AL	1
	FP1033SS	Propeller, 24"DD, 4-Blade, ½" Bore, Set Screws, AL	1
	FP1126SS	Propeller, 26.5" DD, 3-Blade, Set Screws, AL	1
4	FH1231	9" Fan, Motor Base with Reinforcements, AL	1
	FH1008	14" Fan, Motor Mount, PVC Coated	1
	FH1009	16"/18" Fan, Motor Mount, PVC Coated	1
	FH1010	24" Fan, motor Mount, PVC Coated	1
	FH2526	26" Fan, Motor Mount, PVC Coated	1
5	FM1039	9" DD, Motor, ⅙ HP, 3350 RPM, 36 Fr., 1 ph., 115V	1
	FM1038	9" DD, Motor, ⅙ HP, 3350 RPM, 36 Fr., 1 ph., 230V	1
	FM1010	14" DD, Motor, ⅛ HP, 1625 RPM, 48 Fr., 1 ph., 115/230V	1
	FM1043	16" DD, Motor, ¼ HP, 1625 RPM, 48 Fr., 1 ph., 115/230V	1
	FM1009	18" DD, Motor, ⅓ HP, 1625 RPM, 48 Fr., 1 ph., 115/230V	1
	FM1008	24"/26" DD, Motor, ⅓ HP, 1075 RPM, 48 Fr., 1 ph., 115/230V	1
	FM1070	24"/26" DD, Motor, ⅓ HP, 1075 RPM, 48 Fr., 3 ph., 208-230/460V	1
6	FH2117	Left Shutter Clip, Al (14"-24" fans only)	1
7	PT0914	Shutter, 16¾" SQ., Belted inlet, White Plastic	1
	PT1618	Shutter, 21⅝" SQ., Belted inlet, White Plastic	1
	PT24	Shutter, 27⅝" SQ., Belted inlet, White Plastic	1
	PT26	Shutter, 29.4" SQ., Belted inlet, White Plastic	1
8	PZ09	Shutter, 11⅞" SQ., White Plastic	1
	PZ0914	Shutter, 16¾" SQ., White Plastic	1
	PZ1618	Shutter, 21⅝" SQ., White Plastic	1
	PZ24	Shutter, 27⅝" SQ., White Plastic	1
	PV26	Shutter, 29.4" SQ., White Plastic	1
9	FH1227	9" Fan, Guard with Endcaps, SS (9" only)	1